

## Targeted Delivery of Novel Copper-Based Nanoparticles for Advance Cancer Therapeutics

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**Abstract :** We have explored the synergistic anti-cancer activity of copper ion and acetylacetonate complex containing 1,3 diketone group (like curcumin) in metallorganic compound "Copper acetylacetonate" (CuAA). The cytotoxicity mechanism of CuAA complex was evaluated on various cancer cell lines in vitro. Among these, reactive oxygen species (ROS), glutathione level (GSH) in the cell was found to increase. Further mitochondrial membrane damage was observed. The fate of cell death was found to be induced by apoptosis. For application purpose, we have developed a novel biodegradable, non-toxic polymer-based nanoparticle which has hydrophobically modified core for loading of the CuAA. Folic acid is conjugated on the surface of the polymer (chitosan) nanoparticle for targeting to cancer cells for minimizing toxicity to normal cells in-vivo. Thus, this novel drug CuAA has an efficient anticancer activity which has been targeted specifically to cancer cells through polymer nanoparticle.

**Keywords :** anticancer, apoptosis, copper nanoparticle, targeted drug delivery

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